Few concepts have had greater effect on the science of genetics than the laws of probability. **Probability refers to the chance of something happening**. Under normal conditions probability calculations can give us good ideas of what to expect from different genetic combinations. A thorough understanding of probability was instrumental in leading Gregor Mendel to his basic conclusions about genetics, and these same laws of probability play an essential role in genetics today.

**Question:** What is the probability of each outcome (HH, HT, TT) if two coins are flipped 100 times?

**Hypothesis:** ­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Procedure:**

1. Your group will flip two coins at the same time and record the results.
2. Flip two coins together and record the results as either two heads, one head on tail, or two tails
3. Continue flipping until you have flipped 100 times
4. Add your data to the board.
5. Record the total for the class and answer the questions

**Data:**

|  |  |  |
| --- | --- | --- |
| Two Heads | One Head and One Tail | Two Tails |
|  |  |  |

Group data: HH \_\_\_\_\_\_\_\_\_\_ HT \_\_\_\_\_\_\_\_\_\_ TT \_\_\_\_\_\_\_\_\_\_

Class data: HH \_\_\_\_\_\_\_\_\_\_ HT \_\_\_\_\_\_\_\_\_\_ TT \_\_\_\_\_\_\_\_\_\_

**Data Analysis:**

1. What percentage of toss for each possibility for both your data and class data.

Group data: HH \_\_\_\_\_\_\_\_\_% HT \_\_\_\_\_\_\_\_% TT \_\_\_\_\_\_\_%

Class data: HH \_\_\_\_\_\_\_\_\_% HT \_\_\_\_\_\_\_\_% TT \_\_\_\_\_\_\_%

1. How do the results compare to the expected outcome? Do you have an explanation for the differences or similarities?

If the coin were to represent the parent plant each side of the coin represents a factor (trait). Let’s say that Heads represents a tall allele (T) and Tails represents a short allele (t).

1. What is genotype for each of the parent plants (coin 1 and coin 2)?
2. What type of plant is represented by 2 heads, a tall or a short plant?
3. What type of plant is represented by 2 tails, a tall or a short plant?
4. What type of plant is represented by 1 head and 1 tail, a tall or a short plant?
5. How many tall plants did your group produce from 100 coin tosses?
6. How many short plants did your group produce from 100 coin tosses?
7. What is the ratio of tall to short plants from your group?
8. What is the ratio of tall to short plants from your class?